

24th DOE/NRC NUCLEAR AIR CLEANING AND TREATMENT CONFERENCE

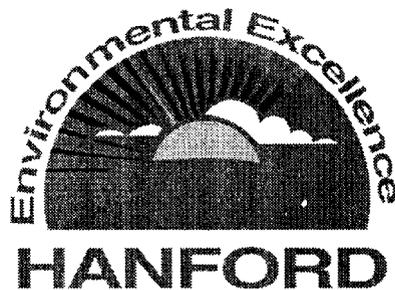
INTRODUCTION

FIRST: On my extreme left is Lou Kovach of NUCON International. You have heard from him previously during this conference, I think most of you know him. I mentioned yesterday morning that he has been very intensively involved in certain of Hanford's innovative operations. Because he has been so intimately involved in Hanford for the past couple of years, I thought it would be appropriate if he would introduce our luncheon speaker.

KOVACH, L: Ladies and gentlemen, I have a Department of Energy biography on John Wagoner, but I would like to start off by ignoring it for a minute and just tell you that I have seen John facing pronuclear civilians, antinuclear civilians, Native American tribe representatives, and then some people even worse, technical staff at Hanford, some of the contractors, National Laboratory representatives, headquarters people, and common folks like us. And there were always a lot of people who were trying to complain about something that the Department of Energy was doing at Hanford. And he always managed very graciously to field the questions and not get mad. And, really, what I admire about him the most is keeping cool in talking about things that sometimes are totally off the wall, and sometimes highly technical. And I know that I could not do that. I'm sure most of you are aware of my temperament. But John has been manager of the US Department of Energy's Richland Operations Office since July of 1990. He is responsible for the Department's mission at the 560 square mile Hanford Site reservation. The Hanford mission is to clean up the environmental legacy from the defense production of the cold and the warm wars of the past. He has worked on many different activities, starting with the Schenectady Naval Reactor's Office through various projects at Oak Ridge. At one time, it looked like, he had managed to escape the nuclear business for a while, and he was project manager for the strategic petroleum reserve. I am sure, John, you think back to those days as more peaceful than some of the nuclear activities. He was deputy manager of the Savannah River Operations Office and worked in the US Navy supply corps. Again, I am not sure if he is happy that he made the decision, but he resigned his lieutenant commander's commission in '71 to accept a civilian appointment at the AEC. In 1983 John got the Secretary of Energy's meritorical service award, and received superior performance awards from the Secretary of Energy in 1990 and 1991. He is from my neighbor state, (not from Serbia or Austria), Indiana and is a good boilermaker from Purdue University. It is a pleasure for me to introduce John D. Wagoner.

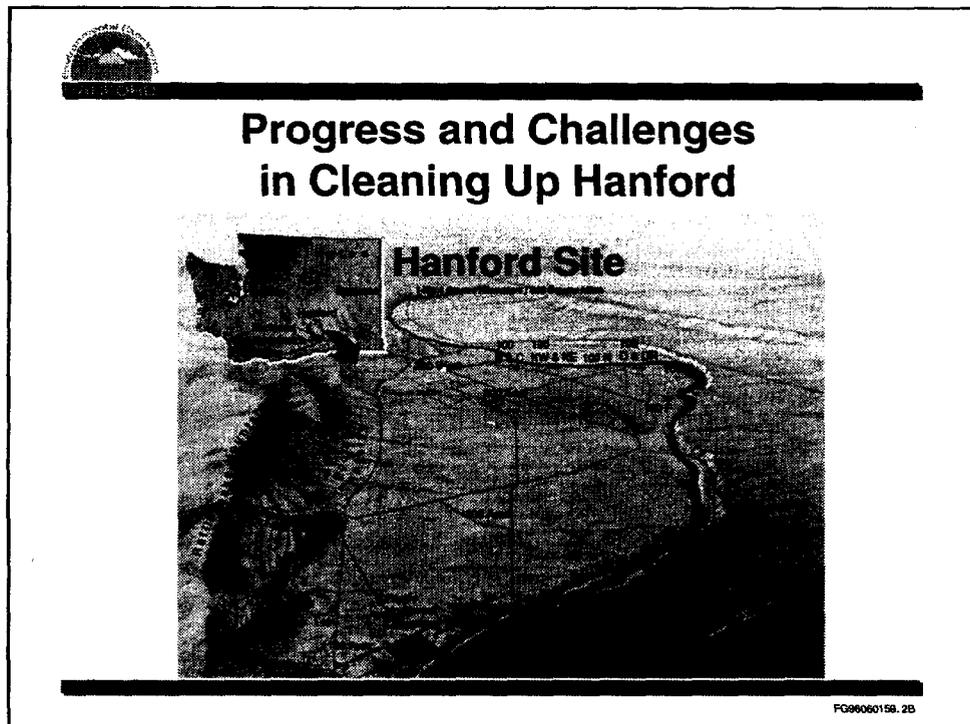
WAGONER: Thank you very much. This is a special privilege for me. This is the first Nuclear Air Cleaning Conference I have ever addressed. My talk will not be about nuclear air cleaning, but maybe you will see some parallels and some areas of interest, as we go talk about what I like to talk about, which is the Hanford Project, or Project Hanford, as we are now calling it. The talk that I'll give today will try to get across a few simple key points. I will describe, of course, what the job is that we are doing at Hanford. And those of you who are working there either all the time or part of the time, I hope you will bear with me if it is redundant with what you already know. The message that I want to get across about that is that the job is getting done. One of the other important parts of it is most of it, I believe, will be complete within ten years. And in order to complete that ten-year vision, we have an awful lot of very difficult problems to resolve. I am sure that a number of you can contribute to doing that. So we'll start with the next slide to try to put things in perspective. I understand that a few of you have signed up for a Hanford site tour, I certainly encourage you to do that. One of the things I believe we have been able to do to better communicate with the public is to make the site accessible.

**24th DOE/NRC Nuclear Air Cleaning
and Treatment Conference**

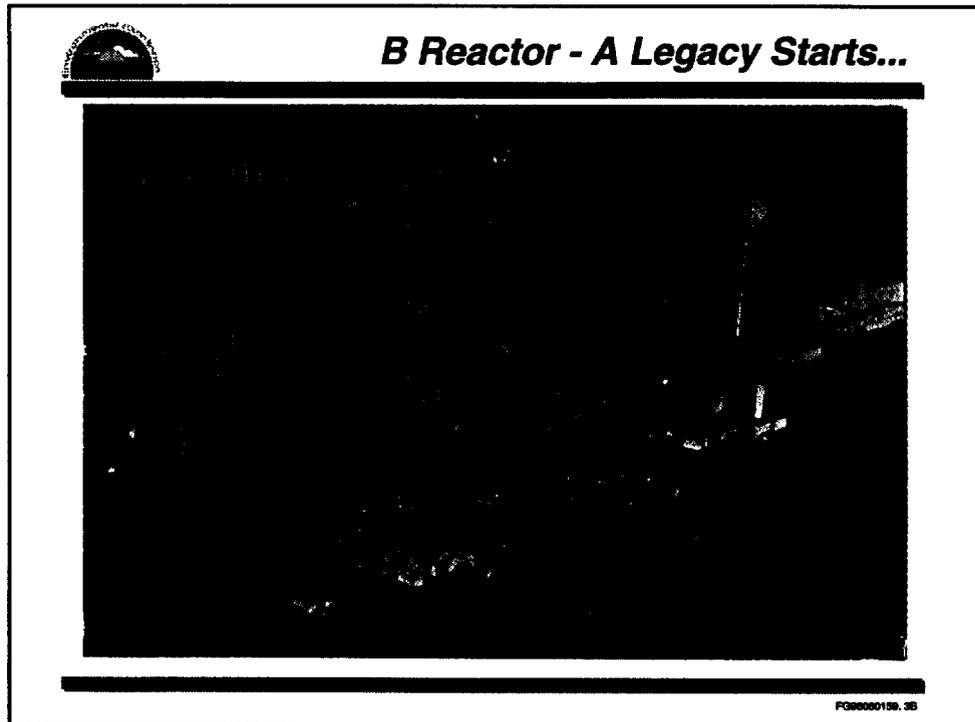


John D. Wagoner, Manager
Richland Operations Office
U.S. Department of Energy

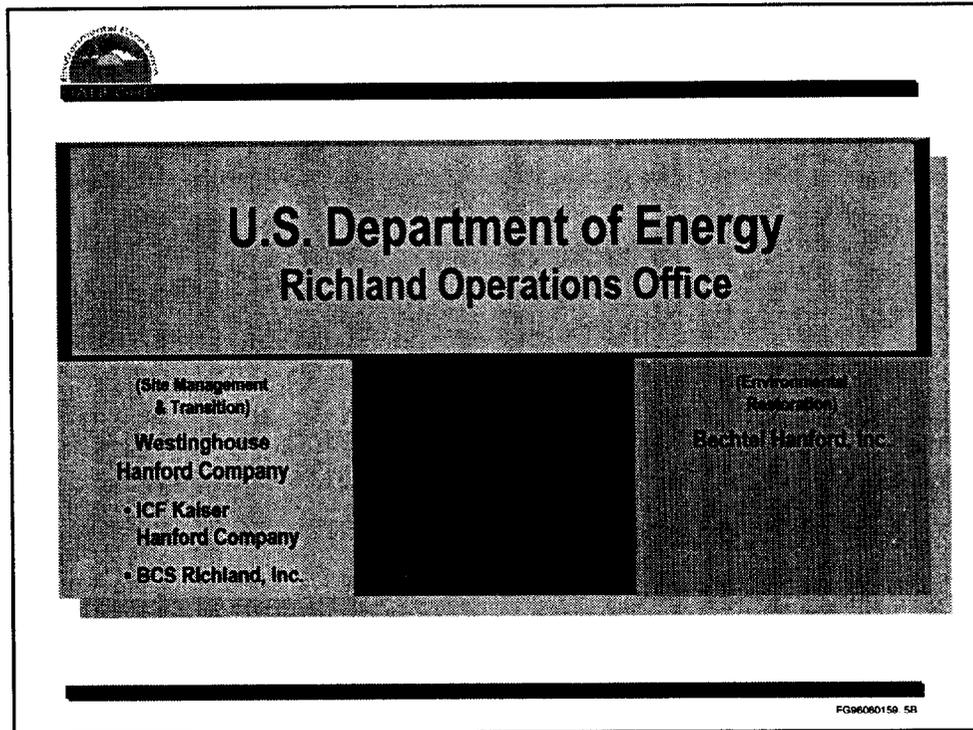
July 16, 1996



Hanford was established in secrecy during the Second World War to produce plutonium for America's nuclear weapons. Peak production years were reached in the 1960's when 9 production reactors were in operation at the Site. All weapons material production was halted in the late 1980s and the Site is now engaged in the world's largest environmental cleanup project.



The famous 'B' Reactor along the Columbia River on the Hanford site where plutonium was produced for the Atomic bomb dropped on Nagasaki, Japan. The world's first nuclear reactor, it was constructed and operational within 14 months in 1944.



Today our cleanup challenge is managed by Westinghouse Hanford Corporation and its subcontractors. A site wide environmental restoration project is managed separately by Bechtel Hanford, Inc. Supporting both Westinghouse and Bechtel, as well as DOE nationwide programs, is the Pacific Northwest National Laboratory with scientific research and technology development.



Progress...

Our Priorities...

- **Urgent Risks**
 - ◆ Tanks
 - ◆ Spent Fuel
 - ◆ Plutonium
- **Mortgages**
 - ◆ PUXEX
 - ◆ B-Plant / WESF
 - ◆ FFTF
- **Waste Management**
- **Environmental Restoration**

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The U.S. Department of Energy and its contractors have tackled the environmental cleanup challenge within the framework of set priorities.

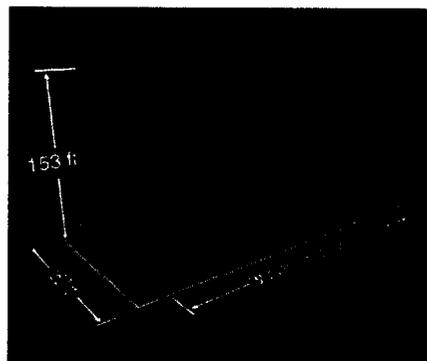


Progress...Urgent Risks

Tanks

177 Underground Waste Tanks

- ◆ 55 MGals High Level Waste
- ◆ 67 Single Shell Tanks Leaked or Suspect
- ◆ Cross Site Transfer Line (West Tanks to East Tanks)
 - ✦ Remove Liquids From Single Shell Tanks
 - ✦ Consolidate Waste For Vitrification
- ◆ Evaporator Campaigns Reduced Waste by 8 1/2 MGals
- ◆ Award Contracts for Treatment of Tank Waste (Vitrification)



FG9000159.75

Formidable challenges in our underground waste storage tanks cleanup effort are being met with innovative approaches and technology. With the construction of a cross-site transfer line we will be able to remove liquids from tanks known to leak to more reliable double-shell tanks.

Additionally, our 'Evaporator Campaigns' have freed-up additional space to receive waste, thereby saving \$600 million in otherwise needed new tank construction. Since 1994 eight million gallons of liquids have been evaporated.

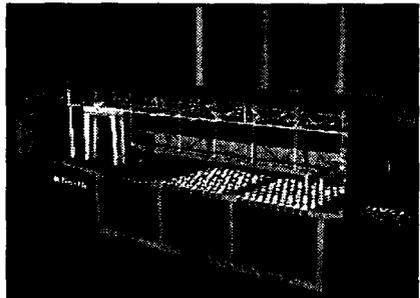


Progress...Urgent Risks

Spent Nuclear Fuel

An Urgent Risk on the Columbia River

- ◆ Fuel Corrosion Continues
- ◆ K Basins 20 Beyond Design Life (recent leakage in 1993)
- ◆ Seismic barriers in Place
 - ✦ Mitigate Leakage
- ◆ Canister Storage Building Design Complete
 - ✦ Construction Started
 - ✦ Fuel Transfer 12/97



2,100 MT/53.8 MCi
105,000 Elements

FG98060159.88

Based in part on advice from our stakeholders, we have identified spent fuel stored in basins near the Columbia River as a priority project to reduce urgent risks at Hanford. The basins in which the 2100 tons of spent fuel reside are 20 beyond their design life and one has a history of leakage of some 15 million gallons.

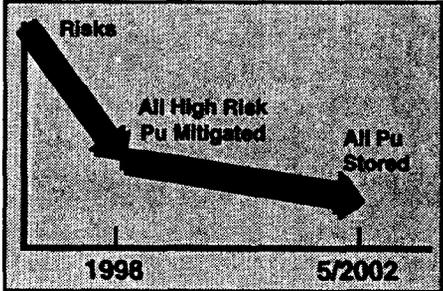
In a very creative way DOE and its contractors have come up with an accelerated plan to remove the spent fuel from the basins and place it in dry storage on the central plateau. One creative way we were able to speed up the project was by using an existing foundation for a cancelled project for the new Canister Storage Building needed to house the spent fuel rods when they are removed from the basins.

Meanwhile we have mitigated the leakage problem with the installation of seismic barriers.


Progress...Urgent Risks

Plutonium Finishing Plant

- ◆ 3.9 Metric Tons of 11 Tons Site Total
- ◆ Completed Stabilization EIS
- ◆ Issued Record of Decision
- ◆ Developed Solutions Stabilization Process
- ◆ Complete Stabilization of All Other High-Risk Materials





We have made significant progress in deactivating this facility. We have completed the plutonium stabilization EIS, issued a Record of Decision, and began a stabilization campaign for all high-risk materials in the facility which will stabilize liquids in FY98 and all material by 2002.

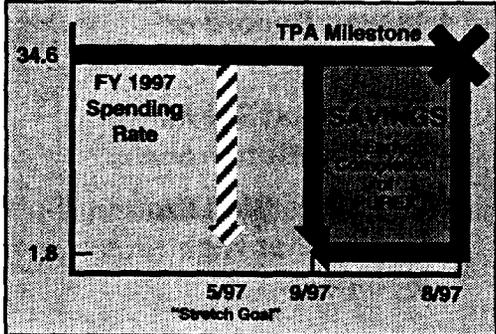
This puts us in a position to mitigate plutonium risks at PFP in 1998 and have all plutonium stored by 2002.


Progress...Mortgages

PUREX

Plutonium URanium EXtraction

- ◆ Major hazards disposition/stabilization
 - + Pu/U solutions (6,000 Gals)
 - + Organic solvents (21,000 Gals.)
 - + Nitric acid (187,000 Gals.)
 - + Residual Pu Oxides (Glove Box)



FG99000158.108

At PUREX we have successfully removed major hazards from the facility in preparation for proceeding with final decontamination and decommissioning. Among the materials dispositioned are: 6,000 gallons of plutonium/uranium solutions; 21,000 gallons of organic solvents, 187,000 gallons of slightly contaminated nitric acid; and residual plutonium oxides from glove boxes.

 **Progress...Mortgages**

B-Plant / WESF (*Waste Encapsulation Storage Facility*)

- ◆ Retrieve remaining Cesium from Private Facilities
- ◆ Plan for FY 1998 B-Plant Deactivation "Breakthrough"



B-Plant 1 MCi
WESF Capsules 149 MCi

FG98060158, 11B

We successfully recovered 25 cesium capsules from a commercial facility in Virginia thus completing the recall of more than 700 capsules which had been leased to commercial companies.

Work on decoupling WESF and B-Plant continued at an aggressive pace and we are poised for a "breakthrough" in B-Plant Deactivation in FY 1998.

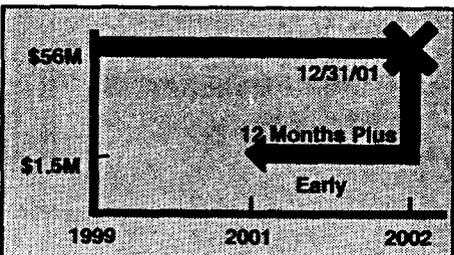


Progress...Mortgages

FFTF

Fast Flux Test Facility

- ◆ **Transition: Operational to Safe Shut Down Condition**
 - ◆ 375 Fuel Rod Assemblies
 - ◆ 260,000 gallons of liquid sodium (coolant)
- ◆ **63 Fuel Assemblies processed to Interim Dry Storage (Complete in 2001)**
- ◆ **Preparing Sodium Storage Facility (4 Tanks) - October '96**



FG98000156. 126

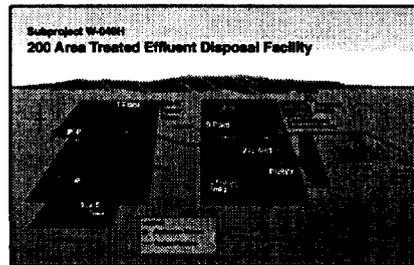
The FFTF continues to be transitioned to a safe shutdown condition in preparation for final decommissioning and decontamination. Work that is not irreversible, such as fuel washing, continues as we await the Secretary of Energy's decision as to whether or not FFTF will be considered as a tritium producer.



Progress...Waste Management

Waste Management

- ◆ **Billions of Liters Untreated Liquid Wastes to Soil (Over 45 Yrs - 200 sq.mi. contaminated groundwater)**
- ◆ **300 Area Treated Effluent Disposal Facility (TEDF)**
 - ✦ **Discharge clean water to Columbia River (Standard 1000 times more stringent than City's)**
- ◆ **200 Area Effluent Treatment Facility**
 - ✦ **National Pollution Discharge Permit (ID'd as one of nation's most stringent)**
- ◆ **Ceased discharge of all liquid effluents to groundwater - 6/95**



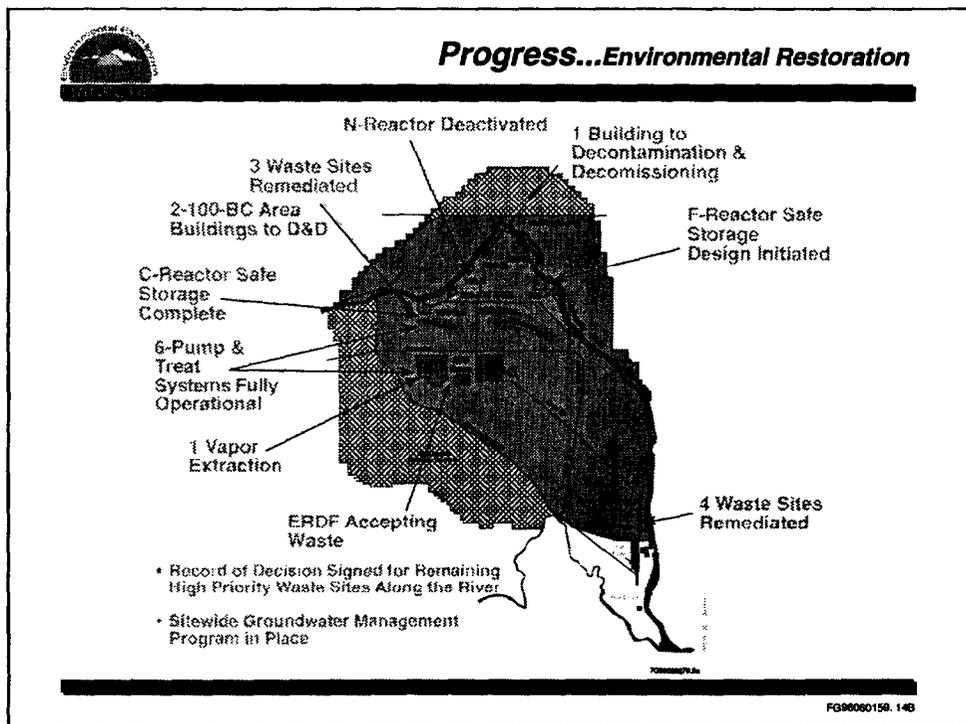
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Exceptional progress has been achieved in the treatment of liquid effluents at Hanford. We brought on line the 300 Area Treated Effluent Disposal Facility and 200 Area Effluent Treatment Facility.

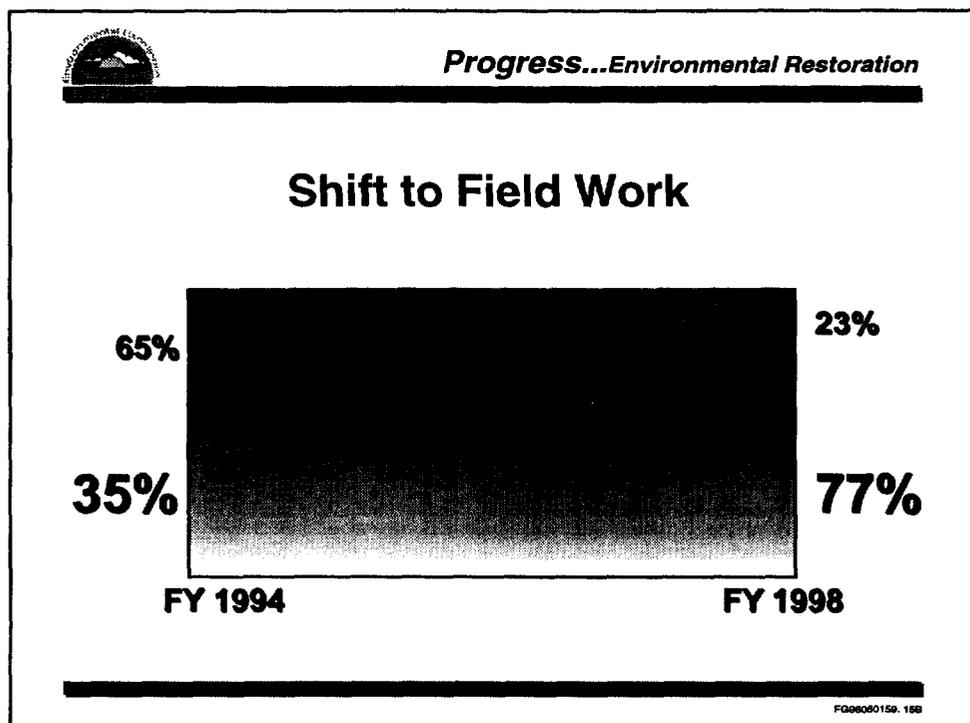
We ceased all unpermitted discharge of effluents to groundwater in June, 1995.

Our discharges to the Columbia River from the 300 Area meet standards 1,000 times more stringent than city requirements.

Our National Pollution Discharge Permit is one of the most stringent in the nation.



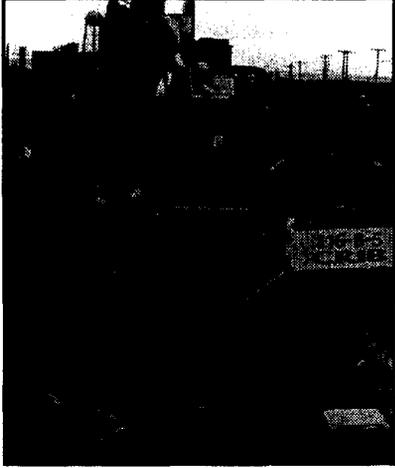
BHI, our Environmental Restoration contractor, is responsible for cleanup of groundwater, contaminated soils, and inactive nuclear facilities. A major focus of the ER program is protecting the Columbia River by cleaning up contamination along a 20-mile stretch of land along the river where nine nuclear reactors are located.



Since the start of ER cleanup activities in July, 1994, cleanup dollars expenditures have shifted from 65% paperwork to 77% actual field work.

 *Progress...Environmental Restoration*

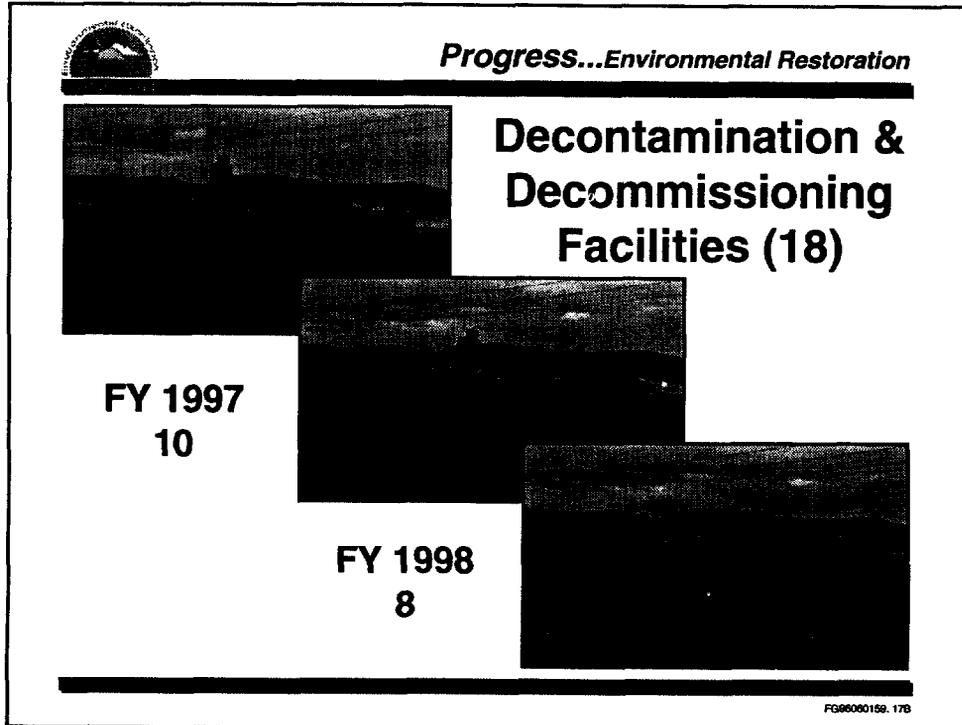
Waste Sites Remediated



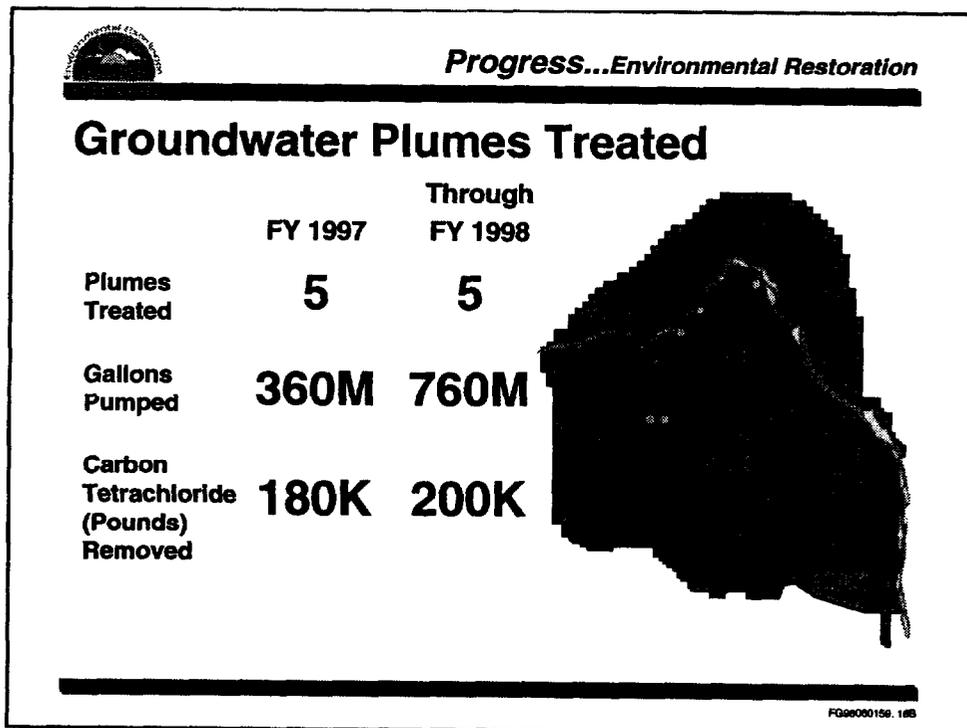
■ FY 1997	- 10
■ FY 1998	<u>- 12</u>
	22

FG96060150.188

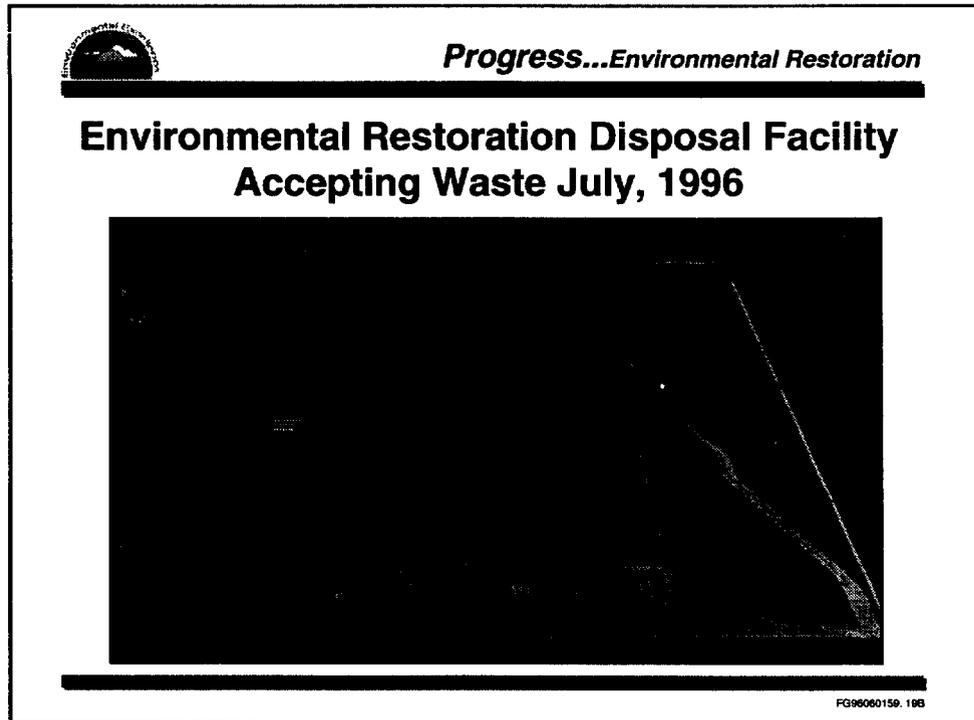
And with more dollars spent on cleanup, we see an increase in progress of actual waste sites remediated. Uncovered cribs and trenches and other waste sites along the Columbia River have produced 37,000 tons of contaminated soils and materials.



Removing Hanford's aging surplus nuclear facilities is the ultimate goal of the D & D program. Here we see the demolition of the 190-D Pump House remaining framework after decontamination.



Containing and preventing the spread of contaminated groundwater, while removing contaminants from aquifers, are major objectives of the ER Groundwater Remediation project. In 1996 the project pumped and treated 83 million gallons of groundwater and removed 159,000 lbs. Of carbon tetrachloride by vapor extraction.



Designed to receive low level waste from site cleanup projects, ERDF is operating 3 months ahead of schedule and roughly \$80 million under budget. These first two `cells' of a possible 12 can safely hold 1.2 million cubic yards of material, equivalent in size to 95 Goodyear blimps.

 *Progress...Environmental Restoration*

N Reactor Deactivated FY 1997

- **67 ancillary facilities also deactivated**
- **N Basin cleaned**



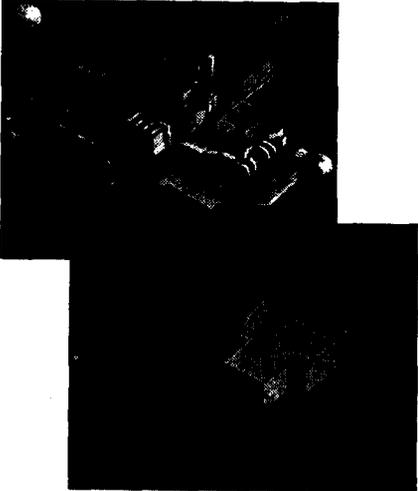
FG96060159, 208

Deactivation of the 'N' Reactor and its supporting facilities is in the DOE spotlight. This effort presents a challenge as to how similar work will be conducted at other DOE weapons sites.

 *Progress...Environmental Restoration*

C Reactor Safe Interim Storage FY 1998

- **Long Term Safe Storage**
 - ◆ **Low Risk**
 - ◆ **No Maintenance**
- **Demonstration Platform for Technology Transfer**



PG0600150.218

Placing the `C' Reactor's core in an Interim Safe Storage mode for up to 75 years, pending final disposition, is a DOE pilot project that will demonstrate 19 technologies in the process. The concept and successfully demonstrated technologies may be duplicated at other sites.



Challenges...

- ***“My primary goal in managing this program is to reduce most of the risks and most of the mortgages over a ten-year period... Most important, we need to move this program toward completion... We have an opportunity to show that a ten-year effort to reduce risks and mortgage costs can substantially reduce obligations and risk on future generations.”***

**Al Alm, Assistant Secretary
Environmental Management
U.S. Department of Energy
(From All Employee Message, May 10th, 1996)**

- **Hanford Vision 2006: Safe Interim Status**

FO9800158, 228

Mr. Al Alm, our new Assistant Secretary for Environmental Management, has presented a challenge to all DOE sites. Within the next 10 years, a majority of cleanup projects throughout the DOE complex is to be completed. D & D, soil remediation, and groundwater cleanup are targeted categories for this deadline.



Challenges...

ongoing/daily...

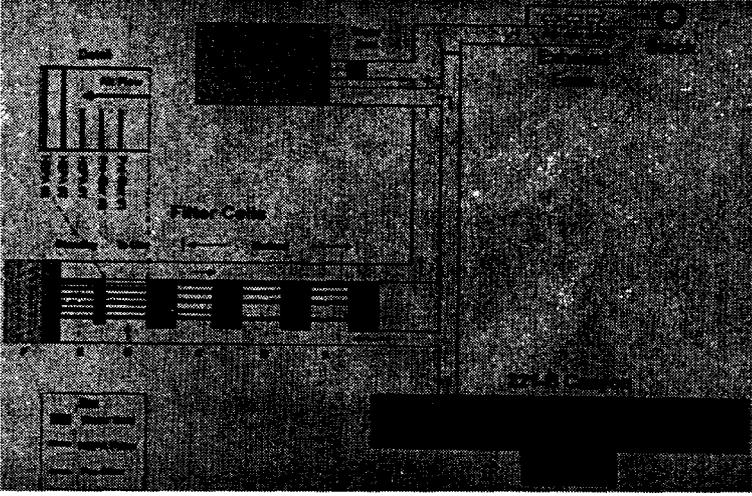
- **Worker and public safety**
- **Waste Management**
 - ◆ **Storage**
 - ◆ **Disposal**
 - ◆ **Transportation**
- **Budget uncertainties**
- **Tri-Party Agreement**
 - ◆ **Commitments**
 - ◆ **Working with Stakeholders/
Regulators**

FG00000150, 23B

Of prime concern in meeting that challenge is the safety of the workers and the public. Cleanup operations must be conducted in a manner that eliminates or minimizes risk to our workforce and the community. Companion to that ongoing challenge is the transportation, storage, and disposition of waste, dealing with varying budgets, and meeting our obligations to regulators and stakeholders.

 **Challenges...**

HEPA Filter - B-Plant



FG98000156, 248

As an example of our worker safety focus, we currently are using the main HEPA Filter System to remove any radionuclides from the air in facilities. Currently, a new HEPA system is being designed with a target installation of September, 1998.



Challenges...Vision 2006

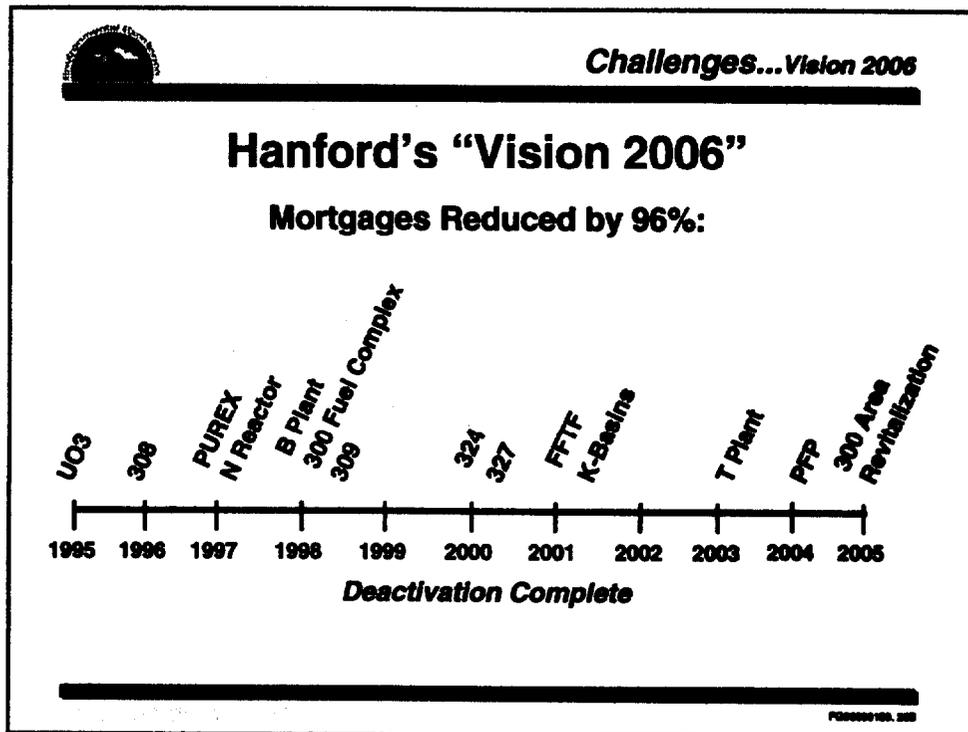
Hanford's "Vision 2006"

All Urgent Risks Mitigated:

- ◆ **SNF (2001)**
- ◆ **Plutonium (2001)**
- ◆ **Tanks (2003)**

FG99080158, 258

Our answer to Mr. Alm's challenge is Hanford's "Vision 2006".
Within the first three years of the plan all urgent risks will be
mitigated...



... our mortgages on major facilities will be reduced by 96%,
and ...



Hanford's "Vision 2006"

Significant Percentage of Current Waste Inventories Treated/Disposed/Stored:

- ◆ **HLW (Tanks): 3 Million Gallons**
- ◆ **TRU: 50% Shipped to WIPP**
- ◆ **Mixed Waste: 50%**
- ◆ **LLW: 100%**

FO8000100.270

... significant impact will be made on our current waste inventories.



Challenges...Vision 2006

Hanford's "Vision 2006"

Environmental Restoration:

- ◆ **7 Reactor Facilities Cocooned**
- ◆ **150+ Waste Sites Remediated**
- ◆ **Complete Remediation of all 100 Areas (Except N)**
- ◆ **Begin Characterization Work in the 200 Area**

FG0000100.200

Our ER efforts will have placed 7 reactors in Interim Safe Storage and remediated more than 150 waste sites.

Questions



HANFORD and Answers

As we have seen, our past progress is notable, but our future challenge is just as noteworthy. I am very confident that our excellent contractors workforce will not only meet the challenge over the next ten years, but will exceed expectations in the process.

DISCUSSION

FIRST: Mr. Wagoner, I've heard all kinds of numbers for when this clean up is going to take place and how much it's going to cost. I recall about five years ago we had thirty years and thirty billion. And then it went up to fifty years and a hundred billion. And now I just heard ten years, but I didn't hear how many billions. But it would be, I'm sure, of interest for us to know how firm the ten year commitment is, and some idea of what the financial implications are.

WAGONER: For Hanford we have requested for the 1997 budget year just under one point four billion dollars. And for fiscal '98, including the financing of the privatized tank waste contracts, that would be a little over one point five billion. So it would run in that range between one and one point five billion per year, between now and 2006.

WEBER: I am curious to know what is the magnitude of the TRU waste, which is in suspense awaiting whether WIPP opens or not. Of that figure, are you able to estimate what proportion of the material has already been drummed?

WAGONER: I should have, but I do not have the figure off the top of my head in terms of the total volume. Most of it is going to have to be repackaged. And for that purpose we built the waste receiving and packaging facility. We are just now completing construction. I think it's essentially complete. And there we will be able to bring the waste in that's retrieved. The TRU waste of Hanford, for the most part, is buried in shallow pits that are retrievable. That will be brought into the facility, it will go through examination, characterization, depending upon what is seen through the non-destructive evaluation. Glove boxes are there to repackage the material and put it into suitable drums, meeting WIPP's acceptance criteria, whenever those get finalized. Bar-coded and then put in a position ready to load for shipment to WIPP. But I do not have the overall figure. If you are interested I can get that for you. On the TRU waste also, in all fairness, it's important to distinguish that we are talking about the so-called retrievable waste, which was placed there after 1970.

BELLAMY: The congressional mandate to complete the DOE/West Valley project would suggest to me that the vitrification of the tank waste that you have proposed, could be done at West Valley at a very significant savings to the taxpayer, if I understood your answer to Dr. First's question properly. Why isn't West Valley being used for that purpose?

WAGONER: I am not sure that the life of the melter at West Valley would be able to handle the Hanford waste. My understanding is that it will have a limited life. It's only got one tank to process, basically, at West Valley. It is the same basic design concept as DWPF, and that melter will have to be replaced periodically. Then you have the issue of transportation, what would be the suitable container for transportation to West Valley. We only need to treat in the high-level waste melter the high level fraction of the waste, so it would suggest you need a pre-treatment facility to separate the high level and low level fractions that would have to be at Hanford anyway. So it's difficult to see that you would find sufficient economy to overcome all those problems to ship it across the country. What we are doing in our approach to privatization is to ask instead for industry to show what they could provide using the technologies that have been previously developed, a lot of it outside of this country. So those are the proposals we are currently evaluating.